

**Interviewee: CRU\_03**

**Name: Clive William Wilkinson**

**Title / Role: Visiting Researcher**

**Organisation: Climatic Research Unit / Old Weather**

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**Interviewer: Paula Goodale**

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Q: Okay, so Clive Wilkinson. Switzerland.

A: Yeah, that's where my main office is. My business partner lives in Switzerland.

Q: Okay. And is that a company? Is that a research organisation?

A: Yeah, it's a consultancy we've just started.

Q: Okay. So you work for--, what kind of organisations do you work with?

A: I had a six year contract with the National Oceanic and Atmospheric Administration. They more or less gave me a freehand to find marine data anywhere in the world, so they just let me go. And so I found where the main data gaps were, which for instance were round the First and Second World Wars, so we found lots of Royal Navy logbooks for those periods. But they also asked me to--, well, they gave me a freehand, so what I did is I compiled an inventory of every major Royal Navy vessel from 1800 to 1950, where it was, what its movements were, where its logbook is, and I also compiled reports for them, which are available, concerning logbooks generally, where they are in the archives, what they consist of, what some of the problems are in using them, this sort of thing.

So I've worked for them. Now unfortunately the programme I worked for, the Climate Database Modernisation Programme, got axed by Congress, the whole programme was axed.

Q: Why was that?

A: Budget cuts.

Q: Oh, usual.

A: Yeah [laughs], usual thing. So I've been picking up contracts with the Met Office, and I've had a lot of interesting opportunities to look into archives. I've looked in most of the archives in Britain. I've been to Norway. I've looked in the whaling archives in Sandefjord, and I've been working in the archives in Chile, with the hydrographic services and the Chilean navy.

Q: So it's always naval data?

A: No, merchant shipping as well.

Q: Okay, so data at sea.

- A: Data at sea, yes. There's some interesting problems with using data at sea, that your instruments are moving around and you're bobbing up and down as well at the same time, which causes problems. It can cause problems. They can easily be overcome. But one of the challenges that face the people who gather the data and compile it is homogenising it, because different countries record data in different ways. They have different types of instruments. They have different scales they use. They have different ways of recording tier position. So you have to reconcile all that information. I mentioned to you earlier that the Norwegians had a different wind scale before 1935 and after that they fell in line with everybody else. And you'll have problems with ships' positions. In the 18<sup>th</sup> and 19<sup>th</sup> century the Greenwich Meridian wasn't used, really, until the 19<sup>th</sup> century, by Britain. The French used Paris. The Spanish used the Naval Observatory at Cadiz. Chile Navy used Greenwich because they based everything on the Royal Navy. And before about 1790 British ships were using their last sighting of land as a meridian. They didn't use the Greenwich Meridian at all. And if you don't put your observations in that sort of historical context, you can start why your ship's sailing through North Africa instead of through the Canary Islands.
- Q: Right. So your expertise is in knowing about how the data was collected or...?
- A: Well, my expertise is finding the data, knowing how it was collected, knowing some of the problems of the--, what I'll do is I'll look through the logbooks, and I've got a lot of experience, I've looked at thousands of them, and I anticipate the problems they're going to have with the data. And sometimes I say, "You're going to have this problem. This is how you overcome it."
- Q: Okay. So you're providing advice.
- A: Advice, yes, yes.
- Q: So you mentioned several services there that you--, so is it always for national services that you work for or do you do work--, is it, you know, government level work or...?
- A: It's usually for met services, mostly the Met Office and NOAA, which is part of the US Department of Commerce.
- Q: And with a view to climate work?
- A: Yes. I work with the Americans--, once we've got a sort of inventory of a particular dataset, we'd actually set about imaging it, digitising it. It would then be formatted. It would be then be quality controlled and go through various other stages, and end up in what's called the International Comprehensive Ocean Atmosphere Dataset, or ICOAD.
- Q: Okay. Is that owned by the Americans?
- A: Yes, it's run out of Colorado, okay, and is the largest collection of global marine data, so it includes air pressure temperature, sea temperatures, all that sort of thing, and it will eventually get assimilated into that. And that's where the scientists go centrally to gather data.
- Q: So would the UK data go in there?

A: Yes, yeah.

Q: So they kind of centralise it?

A: It's a central repository, yeah. It is the biggest dataset in the world for that sort of information.

Q: So you identify the data, you advise on its quality. Do you get involved in anything that happens after the data's been captured?

A: Not really. I can advise on imagining and digitisation. I've done imaging, small amounts of imaging, myself. But after that you start to get into very technical things, where they're handling the data, comparing it, homogenising it, formatting it. I don't get personally involved in it but I like to know what goes on.

Q: Okay. So what do you get out of that?

A: What I get out of that is if I know what they want to do with the data, what sorts of things they will need to do to get the data into a form they can use, then it helps me advise them as to what we need to do at the early stages. So I have a general knowledge of the whole process but I concentrate on what I call the front end.

Q: Yeah, okay. How did you become involved in that in the first place?

A: A very strange set of coincidences, really, because I was doing a PhD in naval administration and I wanted to turn it into a book so I applied for a fellowship at the National Maritime Museum. And when I was applying for this fellowship there was a scientist who wanted to work on logbooks, and I got the fellowship and he didn't but while we were waiting for our interview we had a long chat. And he eventually got European funding to do the work he wanted and knew of my interest, because I took great interest in what he was doing, and said, "Do you want to come and run the--, or be the project manager here?" So I said, "Yes, I'll do that." And then after that the work expanded, the Americans got involved, and by that time I'd become an expert in logbooks and marine data.

Q: So it was originally serendipitous but it became a--,

A: Yes, that's my favourite research method is serendipity. I'll give you an example.

Q: [Laughs] Yes, do.

A: Just now, I was just looking through this and I saw reference to a Swedish ship called the Eugenia, right?

Q: Okay, so this is a--, what kind of book is this?

A: This is a book--,

Q: Meteorology and Hydrography of the Indian Ocean.

A: Yeah, okay, compiled by Charles Meldrum. What he did is he produced a meteorological journal of all the observations he had for the month of March 1853. So this time they were trying to understand how the atmosphere works. They were only just developing the idea that

pressure systems were circular phenomena and cyclones were circular, okay? They were doing this. I happened to come across a reference to the *Eugenia* and he was saying that it's wonderful this ship is doing sea temperatures and all sorts of other things, a Swedish frigate. So I look through what I already have and I have a note of this ship but not a note of it having a logbook that I knew about, this Swedish expedition back in the 1850s. So I just did a little search here and so they've got a collection of papers and results of the expedition, 1851 to 1853, scientific observations, published in three volumes in Stockholm in 1857. So that book will exist somewhere and we can go and, even if we don't find the log, we can find the scientific observations and find out if they've been digitised. 95 percent certain they won't have been.

Q: Are they the sort of thing you'd like to digitise?

A: Yes, yes. And of course if it's in printed form it's very easy to get it digitised. You can just use optical character recognition and just put it straight in. So, you know, serendipity, I just happened to look at something.

Q: And it triggered a connection.

A: It triggered a connection, yes, yeah. The most recent thing I've been working on is sea ice observations.

Q: Sea ice?

A: Yeah, in the southern hemisphere. And it was a contract given to me by the Met Office. They said, "See what you can find." And I thought, this is a tall order, it's the most remote part of the world, not many ships going through it. So far on my Excel spreadsheet I've got over 3,000 entries, going back to about 1819.

Q: So where do you start looking for that kind of thing?

A: Good question. I seem to have a nose for it. Serendipity, as I say, is my favourite research method, but it's knowing something about the history. So I said to them, "Well, I can..." You have to find out exactly what they want, we want sea ice observations, but I read around the subject as well and I find that, you know, the sea ice can often depend on the meteorological conditions. So I said to them, "Well, if you've got ships at high southern latitudes that don't actually see the ice, is the meteorology useful?" "Well yes, it is." Okay, so that immediately expands, you know, the ships I can use. But what you find is that, from about 1850 onwards, the clipper ships that were running to Australia and round the world, they would run at very high southern latitudes, especially across the Pacific. In fact they were trying to take the shortest route because they were trying to break world records. And so, you know, you start looking for those and you find in the Meteorological Office, in the Met Office, in Exeter, in their archives, I can lay my hands on 500 meteorological logs, because they've got the names of the ships, and you can go through their catalogue and say, well, this ship was going here, that ship was going there, that's going to be good. I go and I think I've examined about 100 of them. Some of them have got ice observation, most of them haven't but they're at very high

southern latitudes. And even if they haven't got an ice observation, it does show where the ice isn't. So, you know, even a negative observation is an observation, because they've got all the meteorology, they recorded the pressure and the temperature and they recorded the sea temperatures every four hours.

Q: Is that done daily? Oh, four hours.

A: Every four hours, yeah. And these were--, when these ships were going out they'd actually been contacted by the Met Office, so these are actually Met Office documents that they're filling in.

Q: So it's still standard format.

A: Yeah, yeah. So these aren't the ship's logbooks, these are dedicated scientific logbooks issued by the Meteorological Office of the Board of Trade.

Q: And so how early was that kind of format established, do you know?

A: 1850s.

Q: Right. And since then they've been using this?

A: Well, the format's changed over the years obviously, but they're still being used now, yes. I mean, these days they're done in an electronic format.

Q: Right, okay. So you collect all this data, it's digitised. Do you get involved then in what happens after that? So there is this process of crowd sourcing people to help with the transcribing of the records. Is that something of interest to you or...?

A: I can but I haven't had time to get involved. You need to devote some time to actually go online and talk to the people and I should do it but I haven't, yeah. But as far as the sort of scientific analysis is involved, I'm interested in it but it's not an area of expertise. But I have--,

Q: So what's your key motivation then, would you say, in doing this kind of work?

A: My key motivation is--, well, it may sound rather strange, but I actually feel I'm doing something extremely useful.

Q: In what way?

A: Well, climate change, environmental change, environmental risks, severe weather, I mean, these are all things we need to understand better and I feel I'm making a contribution to help the scientists do their work. So we all like to think we're doing something useful. [inaudible 0:15:34].

Q: Okay, so help scientists do their work, so it's not so much kind of the overall global planet saving, it's more at the--, ensuring that work is done--.

A: Well, I can't save the planet on my own. I can just do my little bit. But no, and quite frankly whenever I get a new assignment to look into something I'm learning something new. And I'm actually writing a book about an environmental history of the sea, which is more of a history

book but it's overlaid with science and using the science to explain what people were experiencing and their perceptions of the environment and the sea and the weather and this sort of thing, because they were very--, you know, back centuries ago they were very good observers but they didn't necessarily understand what they were observing. But their observations were excellent, make no mistake about that.

Q: Okay. So did that surprise you when you--, was that something that you knew or...?

A: It didn't surprise me because the reason mariners took weather observations was for safe and efficient navigation, and so they were very keen observers. So for instance with barometers, they weren't taking readings with barometers so that scientists could use them for scientific investigation. They were using them to try and predict what the weather was going to do, because obviously if the barometer's falling that heralds bad weather.

Q: Yes, yeah, which has an immediate impact on what they're doing today.

A: That's right. But over a period of time--, the sorts of things we're doing, collecting this data today, isn't actually new. People like Matthew Mowry, who was a US naval officer, and Fitzroy, for instance, and Charles Meldrum, this guy who wrote this book I just showed you, they were collecting all data for--, you know, in the 1850s so that they could better understand the weather, and how it worked. We're doing the same thing to better understand the climate, because we've got a pretty good idea of how the weather works. So we're actually doing--, we're not doing something new, we're just doing something more intensive.

Q: It's a progression.

A: It's a progression, yeah.

Q: That's interesting.

A: One of the earliest sort of collectors of this sort of thing were people like Liam Dampier, who's better known as, you know, a buccaneer, and of course Edmund Halley, who you think of as being an astr--,

Q: The comet guy?

A: The comet guy, yes, yeah. He actually went into the--, he made several voyages on a ship called the Paramour into the South Atlantic and he was collecting magnetic observations. He was constructing magnetic charts of the globe. But he also had a spirit based barometer, invented by Robert Hook, and so in 1700 we have our first pressure observations for the North and South Atlantic. We have to wait another 80 years before we get any more, but these were the very first ones.

Q: So they're the pioneers.

A: Oh yeah, yeah. And my colleague in the Met Office, Philip Brohan, has actually taken Halley's observations and converted them to modern equivalents.

Q: Really?

A: Yes, I mean we have methods we use--,

Q: So there's some sort of algorithm to--,

A: That's right, yes, yeah, because once you understand the characteristics of the instrument that's being used you can do a conversion.

Q: Do those instruments still exist? Can you still kind of--,

A: They're probably in the Science Museum. There's a barometer made by Robert Hook. It was an experiment thing and it broke before he got it home.

Q: Ah, okay. So what do you see as being the future of this? Is there anything that you want to do that you're not able to at the moment?

A: There are lots of things we want to do and at the moment it's lack of funding, but it will come eventually. What I like to concentrate on at the moment is looking at those areas of the globe where we have the fewest observations and at the moment I'm concentrating pretty heavily on the Southern Ocean and the South East Pacific, because the historic data coverage is pretty poor.

Q: So where do you go for that kind of stuff?

A: Okay. Well, there's plenty of material in the archives in this country that hasn't been digitised. Well, let's concentrate on the South Pacific. The Royal Navy had a Pacific fleet based in Valparaiso in Chile, none of that's been digitised. There are plenty of merchant ships travelling around Cape Horn to Valparaiso or across the Pacific to Valparaiso and other ports in Chile. There's the guano—well, the nitrate trade for instance was very big in that area. None of those ships' logs have been digitised. US Navy had a fleet also based at Valparaiso, none of that's been done. There's the Chilean Navy, now I'm already working with them. We're already digitising their logs. There's whaling fleets that would be based in Valparaiso and other areas around Chile and Argentina and the Falkland Islands. I mean all this--,

Q: So you know where the material is?

A: Oh yeah, yeah, yeah. I've already catalogued the Chilean Navy archive and I've catalogued more or less what's in the Met Office. I know everything that's in the National Archives in the National Maritime Museum here.

Q: So you mentioned funding. Where does that come from, or where does it not come from?

A: It's very difficult to get funding for data recovery because people want scientific results. A lot of the funding bodies or people who make these decisions don't realise that unless you've got the data, you're not going to do any science, but they don't want to fund the recovery. As soon as you say data rescue, data recovery, they switch off. But there are various other things we can do. So for instance, my colleague in Switzerland and I, we're going to apply for several funding opportunities that have come--, international funding opportunities. So this will

involve, for instance, CONICYT in Chile, working with funding bodies in the UK and in the United States.

Q: So it's applying for grant funding, essentially?

A: It is, yes.

Q: It's not coming from national governments or...?

A: No, they don't have any money, although we do have a few innovations we want to try. This is actually--, my colleague, Jose [surname inaudible], this is our idea. We've actually gone to Chile and we've actually approached people like the agricultural industry and the mining industry that are affected by severe droughts. Chile is a country that is prone to natural disasters, El Ninos, earthquakes, tsunamis, droughts, all sorts of things. So we've actually gone to the agricultural sector and the mining sector and said, "Look, we can do this. Can we work with you, the Chilean government and universities, and we don't actually need a huge amount of money to do this." So the idea is to actually get the people who will actually get something out of it, you know, whether it's farmers or mining companies, and say, "Look, help us fund this. Help us fund this data recovery so we can then process the data and produce an application that you can actually use to make decisions, such as better forecasting, for instance." So this is a bit of an innovation and we're in the middle of trying to get this off the ground. So it might work, it might not.

Q: Is that an approach you think that might work in other localities?

A: Well, we've got to see if it works here first. If it can't work in Chile I don't think it will work anywhere.

Q: Okay. And they're kind of major corporations, are they, or are they--, what type of organisations are they that you're--,

A: Well, we've been to the National Society of Farmers, or the National Society of Agriculture, in Chile, who have a lot of political influence, and they hopefully--, if they can see that, you know, this is something that needs to be done, they can either find money themselves to put into this or they can put pressure on government to actually--,

Q: Lobby.

A: Yeah, that's right, because it seems to be the only way to do this. I mean, we're not talking about huge sums of money. I mean, I'm very cheap [both laugh]. I mean, we could--,

Q: And digitisation's cheaper than it was.

A: It's certainly cheaper than it was. And, you know, we've got enough experience now that we can do a lot of these jobs very efficiently. And I mean, we could probably do everything in Chile, all the hydrographic and all the meteorological data. We could probably do everything from finding the data to actually getting it processed and into a form you can use for probably six million US dollars.



- Q: Right, which is a medium sized European project, isn't it?
- A: It sounds like a lot of money, but when you consider that the--, recently there was a frost in Chile, that the Chilean met services, who are pretty good, they gave a three day warning. They say it was five day but what's the difference between five day--, and they said it was below zero temperatures, that's all they said. There was the most severe frost they've had in living memory and there was one billion US dollars' worth of damage to the wine.
- Q: I was going to say, it must have devastated the vineyards.
- A: Yeah. So, you know, in that context six million US dollars is nothing, if you can actually improve the forecasting capability.
- Q: So there the benefit would be in weather forecasting rather than climate--,
- A: Yes.
- Q: Or is the climate kind of something on top of that that's there for the future?
- A: Well, what actually happens is, if you recover a long line of historical data, you can actually get statistical averages for climate extremes. You can see if they're happening more often, okay? But the other use for them is what is called reanalysis. You've heard of reanalysis?
- Q: I have heard of this term, yeah, yeah.
- A: Okay. And so what you're doing is you're creating a computer model of what the weather was doing before. Now if you're confident that your reanalysis model is actually performing well, you can then run that as a forecast model with more confidence. So the climate and the weather thing are really quite linked.
- Q: They're converging, yeah.
- A: Yes.
- Q: Okay. And do you see this kind of, I suppose, trying to influence the take up of data rescue as being something that's important to your role or is that something for other people?
- A: It is because at the moment I'm working for nothing, okay? I get a few contracts from the Met Office, but my colleague and I, we've been working for two months, several months now, trying to get things going in Chile. He's been to Chile three times, I've been once, and, you know, we've managed to get air fares paid by someone who believes in what we're doing, but we're basically not earning any money yet. But we believe in what we're doing.
- Q: So you're investing in your future.
- A: Yes, yes. And really no one else can do it because I know where all the data is.
- Q: And really is there any kind of--, what does the data rescue community look like?
- A: Most of it's made up of volunteers.
- Q: Is it?

A: It is, yes, and they're all doing tremendous work and it's all costing very--, if it was properly funded, we could do amazing things in a very short period of time. But as it is we're all sort of struggling.

Q: So your specialism is marine.

A: Marine.

Q: Are there other areas of data rescue that are important in weather and climate?

A: Well, terrestrial data. My colleague at the Met Office, Rob Allan--, have you heard of him?

Q: I know of Rob, yeah.

A: The ACRE initiative. Well, he does everything global but he more or less leaves the marine side to me.

Q: Right, okay, so you're the two leads on that?

A: Yeah.

Q: Okay. And so the rest of the community, that's people that are involved in actually doing the work or...?

A: Well, I mean, there are various other organisations that have data rescue departments. So for instance the German weather service, for instance, they've got a big national archive of marine data. I mean, they've got loads of marine logbooks as well. So there are lots of other agencies actually involved in this sort of thing.

Q: Is there any kind of collaboration or are you all working in your own furrows and...?

A: Well, that's what ACRE's for. Rob Allan, he acts as an umbrella organisation to bring everyone together, yeah, which is something that's been needed for a long time, and it's been very, very successful. So it's worth having a close look at what ACRE does and what the ACRE community does. And then there's also IEDRO, the International Environmental Data Rescue Organisation, which is a US organisation. It's made up of volunteers again.

Q: They were just telling me about that downstairs.

A: Yeah, and they do a lot of work in Africa, some work in South America. But what they frequently do is they work with local agencies and they provide them with expertise. They provide them with cameras and other equipment so that they can actually do the work themselves. That's what they--, they don't go in and do the work.

Q: Facilitating.

A: They're facilitators, yeah. But again, it's all voluntary and it's a charity. Do we want to do climate research on charity?

Q: Yeah, it's a tricky question.

A: That's a rhetorical question, I'm not expecting an answer.

- Q: No, exactly.
- A: I have very strong feelings about this. I think it's terrible that, you know, we're doing this.
- Q: So who could make the difference to make this a more concerted effort, more international effort?
- A: Well, I have to say that until the Climate Database Modernisation Programme got axed by Congress the Americans were leading the field in this. They had the foresight to say that this is actually important. They've got a warehouse full of data they've collected from around the world and a lot of it is still waiting to be digitised. But they were--, if you look CDMP up on the web, CDMP, Climate Database Modernisation Programme, I think it cost Congress something like 20 million US dollars a year. And what they would do is they would collect all this environmental data and they would then get people who were living in deprived areas and were unemployed to actually digitise the data, so it also had a social aspect, if you like, putting people to work.
- Q: Like a social enterprise.
- A: That's right, yes. So I mean it just ticked all the right boxes.
- Q: Sounds perfect.
- A: It sounds perfect. And, you know, I really think--, you know, Congress saved 20 million dollars by axing the whole thing and, you know, that must have made a huge difference to the American budget. I'm being sarcastic now, I know. But the Americans were leading the way in this and if we could get something similar going on an international basis...
- Q: Would that be through ACRE? Would it be through IPCC? The WMO? Who would be the ideal place to--,
- A: Well, WMO, but WMO doesn't have any money. No one's got any money, which is why my colleague and I are seeing, well, where is the money? The money's in private businesses. How can they benefit from what we're doing? If we can show them the benefit, if they can have something that will help them manage decisions, then maybe they'll fund this.
- Q: That's interesting. So in Chile you've gone for the kind of primary industries.
- A: Yeah.
- Q: Do you think that's the source globally or is it...?
- A: I think so. Well, you know, when they had this frost and lost all this money, the wine crop, we thought that this is a disaster, but it may have fallen into our laps because, you know, they're now in a position where they can say, well yes, we need to create a national digital dataset of Chilean data. But we'll see what happens. It's difficult to get anyone to make decisions.
- Q: So, you know, you've got these various things going on in different places. Is there a sense of community, of working together, or are you all--, you know, is it more of individual efforts that together make some kind of whole?

- A: Well, it's sort of both. Again, Rob Allan with the ACRE initiative, when we have our annual meetings we get people from all over the world, and the general complaint is no one's got any money. In fact they're even finding it difficult to attend meetings now.
- Q: And the data, when it's--, okay, going back to the data itself.
- A: Go back to the data, yeah.
- Q: When it's digitised and it's transcribed and it's all there ready to be used, is it open data?
- A: Freely accessible to everybody.
- Q: So how would I get access to something like that?
- A: Okay. Well, for the marine data, for instance, you go to ICOADS, okay? Now it does take a long time, so things we may have digitised last year, it might take two or three years to actually get into the dataset because it has to go through a process and then it actually has to be ingested and a new version of the dataset brought out. So, you know, it's not available as soon as you--, well, let me correct myself, it would be available as soon as it's digitised but not in the official dataset. You could ask for the data.
- Q: The raw data.
- A: You could ask for the raw data be given to you.
- Q: But then it goes through all these processes to become homogenised and everything else.
- A: That's right, yeah, yeah.
- Q: Okay. So do you have a feel for who uses that data, who accesses it? Is that known?
- A: That I'm not sure about, but frequently you'll read scientific papers and you can tell, you know, they've got the data from this place or they've got the data from that place, or they'll reference different things.
- Q: I'm just trying to kind of get a--, I'm wondering, you know, who's benefiting from all of this work at the moment. You kind of said, you know, there could be some potential benefit in the commercial sector, but who's using it now?
- A: Right, we could say who's using the reanalysis. So there's something called the 20<sup>th</sup> Century Reanalysis. Now if you went onto their website they may have some statistics about users maybe, about where the users are, not necessarily--, they probably haven't got information on specific names of users but they may give you an indication whether it's insurance or whether it's in China or whether it's in wherever.
- Q: So it feeds the reanalysis work and that obviously then impacts on the other climate and weather work.
- A: That's right.
- Q: But that is the kind of forum for it.

- A: Yeah, you're asking an interesting question here because that question really says--, if someone was wanting to fund this they would ask a question like that, wouldn't they, well, who's using it? And I don't actually have that information.
- Q: Be interesting to know, wouldn't it?
- A: Yes.
- Q: I suppose it would be also interesting, who might want to use it. Are there any other uses that it's not being put to at the moment?
- A: Oh definitely, because, you know, when we talk to the farming community in Chile we can see all sorts of applications for the data, and they're not even aware that you can do this. So I think the one industry that probably is right on the ball with this sort of thing is the insurance industry, okay?
- Q: You'd kind of expect them to be, wouldn't you?
- A: Yeah, yeah. When it comes to, you know, mining companies who are needing to extract water, you know, what environmental impact is that going to have on the hydrology of a particular area or farmers, what we found when we went to Chile was that, you know, the met departments and the environment departments said, well, it's there on a website, and they've got the stuff on a website. But if you're a farmer, you don't have time to sit there looking at a website, I want something that's going to tell me whether--, well, let's say, for instance--, I'll give you a very good example but it'll be an English example. My son in law's a farmer, right? He needs a good weather forecast, because when he's ploughing or doing other jobs in the fields he may have to hire equipment. Now if it's going to hammer down with rain and he can't use the equipment, he doesn't want it sitting there, paying for it, so he needs a very good weather forecast so he knows when he can get out on the fields and do that. And that sort of thing applies all over the globe. The problem with Chile is they haven't got enough rain [laughs], where sometimes we have too much, but it's those sorts of considerations--, because, you know, if you've got good forecasting you can make management decisions. I've got a colleague in Australia who says a forecast is worthless unless someone uses it to make a management decision. I thought, you know, that's--,
- Q: There's something in that.
- A: There really is. And you can--, you know, if you've got a good forecast, you can be--, even save money, you know. You can organise your work better.
- Q: Optimising the use of your equipment or your workforce or whatever.
- A: That's right, yes, or knowing that--, you know, if you've got a long range forecast that says you're going to have a late frost, you may want to do something to your plants so they don't come into bud at the wrong time.
- Q: Sure, yeah.

- A: All sorts of things like this. We could make things much more efficient. And of course it's not only agriculture but it's transport, your whole infrastructure. So for instance at the moment there's a 50/50 chance of an El Niño, a strong El Niño. We don't know how that's going to develop yet but out in the Mid Pacific it looks like something's going to happen. I was going round Valparaiso a week before they had the fire and I was thinking, if they have torrential rain here, all their drains were blocked with rubbish. And they're big drains, they're big grills in the road. I said, they obviously get--, it's big because there's going to be a lot of water down it occasionally. And I thought, these guys need to know that if there's an El Niño they want the water to run under the city, they don't want to run through the streets, which is what's going to happen. So, you know, with better forecasting, you know, they can make the decision to spend money on particular things that are going to avoid disaster.
- Q: Yeah. Gives you something to think about.
- A: Yeah.
- Q: That's great. Is there anything else about your work that you feel would be interesting or useful, based on the little you know about our project?
- A: Which is very little at all. I'm not sure what it is you're trying to do.
- Q: What we're doing is we're trying to look at the journey of weather data from the point that it's observed, whether that's in old records or in new records, and then look at how it gets used in different scenarios. So first of all how it's produced, observed and kind of processed to the level that it's ready, so that's our first case study, which is largely around the Met Office and the weather stations and something around, you know, the old data, the data rescue. Our second case is looking at how that data then is used in different ways in the climate science environment. Our third one is looking at how it's used in the financial derivatives markets, and our fourth one is in citizen science. And again, with citizen science there's an element of creating the data as well as using the data.
- A: Okay. So is there any room in what you're doing to say how--, I'm suggesting the sorts of work that we're trying to do in Chile where we're actually assisting government and we're assisting the agriculture and mining industry with better forecasting, better capabilities, so they can make decisions.
- Q: We've less focused on actual weather forecasting at this point because of our limited time frame. We're a project which is running just over a year. But forecasting's something, you know, we could spend a huge amount of time on. So we've gone for the climate part of the equation as kind of a first case--,
- A: Well, the climate, it's sort of long range forecasting.
- Q: Yes it is, yeah, yeah, very much.
- A: So El Niño, for instance, is actually critical. Forecasting El Niño and forecasting, say, six months ahead is important in Australia with the agriculture and with the coffee industry.

Q: Yeah. But our interest is really in the potential of the impact of social and cultural values on these processes, so how the data's collected, why it's collected in certain ways and what happens to it, who's involved, and also the value that's derived from it. So yeah, is it economic value? Is it for the public good?

A: It's all of those things, isn't it?

Q: Yes, yeah. But there are different interests depending on where you focus and so we're trying to uncover some of those relationships and how that impacts the process of collecting them and managing the data. And from what you've said there's some potentially big impacts on collecting the data from some of those external forces.

A: Yes, yeah, and it's different in different parts of the world, so what goes on in Europe is very different to what goes on in Asia or South America, for instance. If you want to come back to me on any of those things, do let me know. I can put you in touch with--, certainly in South America, with people who can sort of explain things as well.

Q: Great.

A: So is there anything else I can add? Erm... Well, from a very personal point of view, this is all a big challenge and the harder it--, I always say, if it floats and have a logbook I'll find it [laughs]. But I find it a challenge and I'm always learning something new. Although I'm trained as a historian, I know quite a lot about marine science, oceanography, and I've learned it all on the job, basically, just learning about this sort of thing. I'm the sort of person who doesn't stop learning. And as far as the historical data is concerned, I would say there's as much out there that we haven't got than we already have.

Q: So there's much more work to be done.

A: Tons of it. Can I show you a picture of something?

Q: Sure.

A: Get this going again.

Q: Have you been out to Antarctica?

A: I've been close. I was doing--, I've been in their archives.

Q: Ah, that's where the hat came from.

A: Yeah, yeah, in Cambridge. [Searching on computer] I've got photographs of the inside of the archive in Mauritius where this guy Meldrum worked. They've got his storm books. Well, what actually happened is--, obviously not every logbook for every ship has survived, but he was interested in collecting data and cyclones and weather and so whenever a ship went into Mauritius, someone would go down from the observatory and they would copy out the logbook, and they've got these storm books, right, compiled from 1830 onwards, and they're all in this archive. You know, if you give me your email I can probably send you a copy of the pictures.

Q: Yeah, sure. That would be interesting. Are they very different to British archives?

A: No, it shows the stuff in archive is just piled up and it's all mouldering. [Answering phone call]  
[Searching on computer] If somebody wasn't waiting I'd find it, you know how it is.

Q: It's okay. So do they have like a permanent archivist there?

A: That I don't know. I didn't actually go there but it was--, it's horrendous. Things are just falling to pieces and it's just piled up on the shelves and it's all... It's irreplaceable.

Q: So there's work that needs to be done urgently in some places.

A: Yeah, sometimes there can be real problems with data recovery. I've heard about an incident in Africa somewhere where--, IEDRO was involved in this. They gave them the equipment to microfilm--, this is a long time ago, to microfilm all their records. And what they didn't know is that after they microfilmed them they disposed of the originals and the microfilms are now deteriorating.

Q: So there's a real preservation issue as well.

A: A huge preservation issue, yes.

Q: Do you see the data rescue work as preservation or is it a sideline of it?

A: That is an aspect of it, yes. Not all data needs rescuing but it needs recovering so we can use it, but sometimes it is in need of rescue. When I first went round the Chilean Met archive, the conditions it's housed in are perfectly okay but it's in more or less something like a Nissen hut, you know, and there's no fire--, you know, if it caught fire it'd be gone forever. And I've done a lot of work in the naval museum in Valparaíso. You may recall on the news a few weeks ago a fire in Valparaíso, 2,000 homes destroyed. It was within a mile and a half of this museum, so I just reminded them that, you know, if we had a digital backup of images of what you've got--, it would be dreadful to lose the originals but at least--,

Q: The record is there.

A: The record would still be there, yes. And they took the point.

Q: So yeah, that's interesting. So are any archives doing this work just because they're archives? No?

A: No.

Q: It's not a priority?

A: A lot of archives and a lot of archivists don't actually know--, unless it's a dedicated meteorological archive, they don't actually know what they've got.

Q: So they don't know particularly potentially the value in those records.

A: No. I mean, the national archives in the UK have come to realise that the logbooks are quite valuable, but very often archivists--, they're trained in the humanities, as I was. If they see something with lots of numbers in it, they don't know what it is, they're not interested, but if it



says, you know, letter from Thomas Jefferson to George Washington, that's something slightly different. But anything with numbers--, the number of times someone has said to me, "Oh, I remember seeing those in the archive but I never understood what they were."

Q: Do you know, that's interesting, isn't it? There's an education there for the archivists too.

A: Yes, yeah. And the other problem with archiving things, and I'll send you a copy of this--, I have a copy, a photograph, of a memo from someone in the United States, and this was to do with a marine archive, I think it was on merchant shipping or something. They had tens of thousands of these merchant shipping logs. The memo says, "These are of no value to anybody. Dispose of them." And they were.

Q: Yeah. It's... Yeah, I mean, it's... Ooh, it's almost something that--, you need the eye of a commercial archivist, isn't it, that is familiar with business records.

A: It's not so much that. It's just you look at something and you don't see that it could be of any value to anybody.

Q: No. But then you didn't ask.

A: Yeah, but I'm very conscious now--, and as I was saying to my colleague--, "Oh, we won't digitise that because that's not of any interest." And I was saying, "Well, it might be of interest to somebody one day." So what we do, when we go into the logbook, we try and digitise everything if we possibly can. There are often budgetary restraints. We try and digitise everything, even those things that we think are of minimal value or no value at all, because in 50 years' time that might be what somebody wants.

Q: Is the material catalogued, even if it's not digitised? Do people know that the documents exist?

A: Erm, there are different levels of cataloguing, okay? Most catalogues are fairly basic. And this is why I've got a nose for things. Anything that says miscellaneous grabs my attention [laughs].

Q: Okay, that's a good tip.

A: Yeah, okay, because it means that there are so many things in there that are so diverse that no one could be bothered to actually go through it. And when it says miscellaneous in my view it's because it's got lots of stuff with numbers on and they didn't know what to do with it.

[End of interview]